The State of New Hampshire
***Department of Environmental Services***

**Michael P. Nolin**
Commissioner

April 18, 2005
**Letter of Deficiency**
DSP#05-006

Mr. Donald Garrepy, P.E.
Dept. of Public Works
Town of Wolfeboro
P.O. Box 629
Wolfeboro, NH 03894

RE: Wolfeboro Sewer Lagoon Dam #258.15, Wolfeboro

Dear Mr. Garrepy:

The Department of Environmental Services, Dam Bureau (DES) consistently strives to enhance the safety of dams in New Hampshire through its dam safety program. One of the many instruments that play a part in reaching this goal is our inspection program. DES is forwarding this correspondence to you to advise you that in accordance with RSA 482:12 and Env-Wr 502.02, an inspection of the subject dam was conducted on April 29, 2004. During this visual inspection and/or file review, the following items were observed:

1. The following items were noted regarding the 8 inch CMP toe drains;
   a. The design plans indicate there is an 8 inch CMP toe drain running the entire length of the embankment. However, the plans do not indicate how many toe drain outlets there are. During the inspection 3 were observed, and the area surrounding the pump house was wet with standing water;

   b. The left most (as looking downstream) toe drain outlet was submerged due to an incorrectly installed HDPE culvert under the gravel access road. Flow exiting the toe drain was estimated to be 8-10 gpm with an impoundment level about 6' below dam crest (694');

   c. The toe drain located approximately 100 feet to the right of the pump house was partially clogged and flowing approximately 5 gpm;

   d. The right most toe drain was flowing freely about 5 gpm;

   e. The estimated life span of CMP pipes ranges from 30-50 years. This dam was built in 1975 (or 30 years ago). These pipes are approaching the end of their design life;

2. The design plans indicate the maximum water surface elevation is 697.0 feet (i.e. 1 foot below spillway crest;

3. The following items were noted regarding the concrete overflow spillway:
   a. The vertical construction joints on both the left and right side walls were generally deteriorated with spalling concrete;

b. The spillway floor had several areas of spalling concrete and grass growing in the construction joints;
c. The earth embankment elevations on both sides of the spillway ranged 4-12 inches below the top of the concrete wall elevation;

4. There is a wet area located approximately 80 feet downstream of the concrete spillway. It is unclear if this is due to seepage or runoff from the adjacent hillside;

5. There was a steel casing observed in the embankment located at the top of embankment upstream from the pump house. It is unknown what this casing is;

6. The 1997 hydrologic/hydraulic analysis conducted by GZA GeoEnvironmental indicates that the as-built elevation of the embankment crest varies from 699' – 700'. The analysis also indicates that the 100 year event has a peak elevation of 698.94'. If this is true, the dam does not have adequate freeboard during the design event;

7. There is no operation and maintenance (O&M) plan on file with DES; and

8. The emergency action plan (EAP) was tested in February of 2005. However, it appears that the 1998 inundation map was not reviewed to verify that no new construction has taken place within the inundation area.

DES believes that the above deficiencies can be corrected by performing the following items by the indicated schedule:

**August 1, 2005:**

1. The following items are related to the toe drains:
   a. Review all design and as-built information in an attempt to determine how many toe drain outlets were constructed. Provide DES with a plan showing alignment of and location of all outlets;
   b. Investigate and report the source of the wet area located around the pump house. Depending on the source of water, the toe drain/seepage collection system may need to be modified;
   c. The gravel access road culvert located downstream from the left most toe drain outlet must be removed and reinstalled to prevent submergence of the toe drain pipe;
   d. The toe drain located approximately 100 feet to the right of the pump house must be cleaned out and if necessary dredge the outlet swale;
   e. A formal log must be developed that records the flow of water in each toe drain along with corresponding impoundment elevation. The interval of data collection should be customized to standard impoundment level operating procedures. For example, if the impoundment level is fairly constant, monthly monitoring may be acceptable, however, the impoundment level is constantly changing, weekly monitoring may be required;
   f. Please be advised that the life span of CMP pipes ranges from 30-50 years. Consideration should be given to conducting a camera inspection of the pipes to determine their condition;

2. The design plans indicate that the maximum water surface elevation is 697.0 feet (i.e. 1 foot below concrete spillway crest). As such, the impoundment should not be operated above that elevation. In order to operate above elevation 697.0 feet, the following items must be submitted and approved; hydrologic/hydraulic analysis to determine if the spillway discharge channel can sustain more frequent use, stability analysis, and seepage analysis;

3. The following items must be addressed regarding the concrete overflow spillway:
   a. The vertical construction joints on both sides must be repaired;
   b. The spalling in the spillway floor must be repaired and all grass growth must be removed;

4. Investigate and report on the source of the wet area located approximately 80 feet downstream of the concrete spillway;

5. Investigate and report on the purpose of the steel casing located at the top of the embankment upstream from the pump house;

6. Survey the elevation of the dam crest. If the elevation is found to be below 700 feet as specified on the design plans, regrade as necessary using the soil that meets the specifications on the design plans;

7. Prepare and submit an O&M plan in accordance with the attached guidelines; and

8. Review the 1998 inundation map in the EAP to verify that no new construction has taken place within the inundation area. If additional development has occurred, submit documentation to DES for review and update the maps accordingly and distribute to all EAP holders. For questions relative to your EAP you can contact Ms. Bethann McCarthy, P.E., EAP Coordinator at 271-3406.

DES is requesting that you complete and submit the attached "Intent to Complete Repairs" form, within 30 days of receipt of this letter, that will provide for correction of the identified deficiencies by the date(s) indicated above. Please call or write to our office if the repairs are completed ahead of the aforementioned schedule so that DES may schedule a follow-up inspection. Unless notified otherwise, DES will conduct the follow-up inspection on or after the date(s) indicated above. If you believe changes to the items of work or dates are necessary, please make the changes directly on the form and provide a brief explanation. We have enclosed a self addressed stamped envelope for you to return this form.

Our intent in sending you this correspondence is to make you aware of items that DES believes warrant your attention to insure the continued safe operation of your dam. It is our hope that, through the submittal of the attached form and a commitment to keeping a well-maintained dam, you will voluntarily comply with the requested items of work. If we do not receive the intent form or a similarly adequate written reply, we will assume that you are in agreement with our findings and recommendations and DES will carry out follow-up inspections accordingly.

If you have any questions or comments regarding this Letter of Deficiency or would like to be present at future inspections, please contact me at 271-3406, or write to the Water Division at the address listed on the bottom of the cover page.

Sincerely,


Jeffrey M. Blaney, P.E.
Dam Safety Engineer

Attachments Guideline for an O&M plan, DB13
cc: Gretchen R. Hamel, Legal Unit Administrator ✓
Bethann McCarthy, P.E., EAP Coordinator
Mitch Locker, Water Supply Engineering Bureau
Certified #7000 1670 0000 0588 6066
JMB/was/h:/safety/wendy/lod/25818lod.doc